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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/697,760	10/30/2003	Minhua Lu	YOR920030499US1 (17075)	8778
23389 7590 09/25/2008 SCULLY SCOTT MURPHY & PRESSER, PC 400 GARDEN CITY PLAZA SUITE 300 GARDEN CITY, NY 11530			EXAMINER NGO, HUYEN LE	
			ART UNIT 2871	PAPER NUMBER
			MAIL DATE 09/25/2008	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/697,760	Applicant(s) LU ET AL.	
	Examiner Julie-Huyen L. Ngo	Art Unit 2871	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 June 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 3,5-11 and 18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 3, 5-11 and 18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

Applicant's arguments with respect to claims 1 and 18 based on the Response filed on June 30, 2008 have been considered but are moot in view of the new ground(s) of rejection. Therefore, this is Final action.

Drawings

The drawings are objected to under 37 CFR 1.83(a).

The drawings must show every feature of the invention specified in the claims. Therefore, the feature of **"90°-meta-stable alignment states"** amended in **claim 7** must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New

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Sheet” pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 5-7 and 18 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 5 depends from on claim 7, which cites “said second substrate aligned opposite said first substrate has a grooved surface profile and said second alignment layer having a grooved surface profile”. However, the claim 7 cites “a second substrate having a flat surface profile and a second alignment film layer formed thereon”.

Claim 6 cites “*a surface anchoring energy is increased as compared to LC material deposited between flat substrate surfaces*”. It is note that claim 6 is depended from claim 7, which do not have flat substrate surfaces since claim 7 recites “*a first substrate having a grooved surface profile*”. Also, the elected embodiment shows in Figs. 1-3 does not show flat substrate surfaces. Furthermore, the language of this claim is unclear of how the “*surface anchoring energy is increased*” and how it is compare to the LC material deposited between the flat substrate surfaces.

In claim 7, it is unclear what applicant meant by “*a first alignment film of inorganic or organic material having 90° meta-stable alignment states eliminated at the surface of said alignment film layer and having an increased alignment force for constraining deposited LC material to an alignment direction parallel to the grooves*”. It is unclear of how the first alignment film has an increased alignment force and how this force is generated to constrain the deposited LC material.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 5, 7, 9-11 and 18 are rejected under 35 U.S.C. 102(b) as being anticipated by Sugawara (US 5438421).

With respect to claim 7, Saguawara discloses a liquid crystal display (LCD) device comprising:

- a first substrate having a grooved surface profile:
- a first alignment film layer of inorganic or organic material formed on said grooved surface of said first substrate and having said grooved surface profile, said first alignment film of inorganic or organic material having **inherent physical properties** of 90° meta-stable alignment states eliminated at the surface of said alignment film layer and having an increased alignment force for constraining

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deposited LC material to an alignment direction parallel to the grooves due to LC material staying in the grooves; [Where the claimed and prior art products are identical or substantially identical in structure or composition, or are produced by identical or substantially identical processes, a prima facie case of anticipation has been established. In re Best, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977)]

- a second substrate having a flat surface profile and a second alignment film layer formed thereon, said second substrate aligned opposite said first substrate for forming a plurality of LCD cells having said liquid crystal (LC) material deposited therein, said LC molecules aligning parallel to the alignment direction of said alignment film layer formed on said grooved surface of said first substrate, wherein aligning the LC molecules parallel to the grooves inherently enables decreased potential energy of said LC molecules.
- a first substrate having a grooved surface profile; an alignment film layer of inorganic or organic material formed on said grooved surface and having said grooved surface profile, said alignment film of inorganic or organic material having 90° meta-stable alignment states eliminated at the surface of said alignment film layer and having an increased alignment force for constraining deposited LC material to a direction parallel to the grooves;
- a second substrate aligned opposite said first substrate for forming a plurality of LCD cells having said liquid crystal (LC) material deposited therein,

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wherein

Claim 5:

- the second aligned substrate (fig. 10, ref. 41) opposite the first substrate includes a top alignment layer (fig. 10, ref. 48) having a grooved surface profile.

Claim 9:

- said grooved surface profile of said alignment film is sinusoidal as Fig. 1 shown.

Claim 10:

- said grooves are not continuous along a lengthwise direction as Fig. 1 shown.

Claim 11:

- the grooves are terminated in a length direction and restart in a slightly different location lengthwise with different height and width of said grooves as Fig. 1 shown.

Claim 18:

- said alignment film formed on said first substrate having said grooved surface profile is subjected to an incident ion beam in a direction parallel to a grooving direction to avoid weak anchoring and 90 degree meta-stable states in liquid crystal (LC) material resulting in said increased alignment force. The feature of “to avoid weak anchoring and 90 degree meta-stable states in liquid crystal (LC) material resulting in said increased alignment force” is **inherent physical properties** of “said alignment film formed on said first substrate having said grooved surface profile is subjected to an incident ion beam in a direction parallel to a grooving direction” This feature of “to avoid weak anchoring and 90 degree

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meta-stable states in liquid crystal (LC) material resulting in said increased alignment force” is result of 90°-meta-stable alignment states eliminated at the surface of said alignment film layer and having an increased alignment force in claim 7.

Claim 3 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sugawara (US 5438421) as applied above to claim 7, and in further view of Callegari et al (US6020946).

Sugawara fails to specifically disclose an alignment film of inorganic material being a diamond-like carbon or selected from a group comprising amorphous hydrogenated silicon, glass, Sic, 302, Al₂O₃, CeO₂, SnO₂, and ZnTiO₂.

Callegari teaches (col. 3, lines 8-15) forming a LCD device using an alignment film of inorganic material being a diamond-like carbon or selected from a group comprising amorphous hydrogenated silicon, glass, Sic, SiO₂, Al₂O₃, CeO₂, SnO₂, and ZnTiO₂ (col. 3, lines 1-15) for reducing manufacturing steps and cost. Ultimately, this serves to provide greater design flexibility in LCD devices without sacrificing its optical characteristics (col. 3, lines 16-24).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify a liquid crystal display device as Sugawara disclosed to have an alignment film of inorganic material being a diamond like carbon or selected from a group comprising amorphous hydrogenated silicon, glass, Sic, SiO₂, Al₂O₃, CeO₂, SnO₂, and ZnTiO₂ since one would be motivated to provide an

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optically transparent and amorphous or fine-grained material, which are comparable to polyimide films but require fewer steps and are less costly to manufacture (col. 3, lines 8-15). Ultimately, this serves to provide greater design flexibility in LCD devices without sacrificing its optical characteristics (col. 3, lines 16-24).

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Julie-Huyen L. Ngo whose telephone number is (571) 272-2295. The examiner can normally be reached on M-Thursday.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Nelms can be reached on (571) 272-1787. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Julie-Huyen L. Ngo/
Primary Examiner
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